

Work Order ID 65699

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Friday, January 21, 2011 2:51:23 PM

Item ID: D407-667-205

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Aft

Start Date: 1/24/2011 Start Qty: 1.00

Cust Item ID:

Required Date: 2/4/2011 Req'd Qty: 1.00

Customer:

Reference:

Run Start

Approvals: Process Plan: mf Date: 11-01-21

Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D407-667-245	Rev F

100

0.00

DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D407-667-205 CHG006

CHG007 per DSZ 1158

Sulatz

11-4-21

110

0.00

Pick Kit
Packaging

Packaging

Memo

0.00

Packaging

DP

11-3-30

120

0.00

BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio 21

DP

11-3-30

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130	QC15- Crosstube Dimensional Check	0.00							
QC	Memo	0.00							
Quality Control									

8403/30

(A)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Run Start

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

140

0.00

Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes.

2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes.

5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245.

6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes.

7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.

8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

9- Scribe tube to identify on the inner chamfer in the cuff D# and B#

10-Deburr & Inspect for surface damage. Repair damage within limits as per

JB
BE 11/03/30

SAD 11-04-01

W/O:		WORK ORDER CHANGES					
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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180	Outsource process - NDT per QSI038 4.1	0.00							
Outsource2	Memo	0.00							
Outsource process - NDT	Liquid Penetrant Inspection as per QSI 0380 Issue P/O: 13901 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order								
190	Packaging	0.00							
Packaging	Memo	0.00							
Packaging	Ensure copy of NDT results attached to work order.								
200	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control									

CL 11/04/05 (1)

11/04/05 (1)

11 04 05 (1)

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Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210	SprayPaint	0.00							
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside crosstube with White Imron as per QSI 005 4.2 PRIME: Start Time: _____ 11-04-12 Finish Time: _____ PAINT: Start Time: _____ 11-04-13 Finish Time: _____								
220	QC14- Inspect Spray Paint	0.00							
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								

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WORK ORDER CHANGES

DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11-04-12	210	prime entire outside surface of tube allow 4hrs flash time (using temp epoxy primer) - clean coat inside surface of tube using Imron 2.1-HQ-C as per manufacturer's spec (coat inside of tube slightly wider than 2" wide and 2" away from cuffs)	BT	11-04-13	1	11-04-13	11-04-14
11-04-12	210	- allow to dry over night - mask off inside of tube 2" wide + 2" away from each cuff (inspection window) scuff exposed primer using scotchbrite + paint using Imron 333 white	BT	11-04-13	1	11-04-13	11-04-14

Part No: D407-667-205 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
230	Crosstubes	0.00							
Crosstubes	Memo	0.00							
Crosstubes	1-Install abrasion strips as per QSI 035 using DT8674. Install chafing shield as per Dwg D407-667-245. Note: (3) top holes should be facing up. 2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe 3-Install support with magnobond and install clamps as per Dwg D407-667-245 using installation jig DT9025. Torque clamps to 80-100 in lb A/R Magnobond Batch: <u>116678</u> EXP: <u>11/08</u> 4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.								
240	QC5- Inspect part completeness to step on W/O	0.00							
QC	Memo	0.00							
Quality Control									

BT 11-04-19
Pto
11 04 21 (1)

W/O: 65699		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
11-04-14	230	install chasing shields using Pro Seal P/S 890 B-2 m 117395	RT	11-04-19	1	11.04.14 QSI OK	11.04.21	

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Reference:

Run Start

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
250	Pick Kit	0.00							
Packaging	Memo	0.00				11/14/21			
Packaging									
260	QC4- 100% Inspect kits for completeness	0.00							
QC	Memo	0.00				40			
Quality Control									
270		0.00							
Packaging	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and in kanban rack Location: 33								
	Rec F								

W/O:		WORK ORDER CHANGES					
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Reference:

Run Start

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
280	QC21- Final Inspection - Work Order Release	0.00							
QC	Memo	0.00							
Quality Control									

11/04/25
mf
11-04-21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

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Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Start Date: 1/24/2011

Required Date: 2/4/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM
IPP Rev:D Added Magnobond, Rubber Cushion & Clamps 07-02-19
JLM

****CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER****

IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified
by:EC

IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC

IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC

IPP Rev:H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I

10.04.07 revise route seq. in bom DD verified by:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
AN5-10A Bolt		Purchased	No			250	Each	153.0000	10	10		11/16/24	
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				ST337		153							
				115589		50							
				115700		103							
AN5-32A Bolt		Purchased	No			250	Each	198.0000	4	4		11/4/21	
				<u>Location</u>		<u>Loc Qty</u>		<u>Loc Code</u>					
				ST340		198							
				115016		50							
				115108		50							
				115589		60							
				115698		38							

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Parent Item Name: Crosstube Aft

Start Date: 1/24/2011

Required Date: 2/4/2011

Start Qty: 1.00

Required Qty: 1.00

AN5-34A Purchased No 250 Each 56.0000 4 4

Bolt

Location	Loc Qty	Loc Code
ST340	56	
113149	2	
115835	20	
116003	20	
116191	14	

AN960JD516 NAS1149D0563J Purchased No 230 Each 34.0000 18 18

Washer

Location	Loc Qty	Loc Code
ST	34	
103694	18	
107534	12	
109287	4	

D2856-400 Manufactured No 230 f 244.9810 1.288 1.355789

Abraison Strip

N/A as per
P/O @ step 230

Location	Loc Qty	Loc Code
ST403	244.9810421	
56626	0.00004211	
59920	44.581	
63735	200.4	

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Shop Packet Print

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Start Date: 1/24/2011

Required Date: 2/4/2011

Start Qty: 1.00

Required Qty: 1.00

D2873-043 Manufactured No 230 Each 8.0000 2 2

Nut Plate Assembly

66898

8T 11-04-20

Location Loc Qty Loc Code

LG	6	
63497	6	
ST	2	
60981	2	

D2873-045 Manufactured No 230 Each 8.0000 2 2

Nut Plate Assembly

65992

8T 11-04-20

Location Loc Qty Loc Code

LG	8	
60982	4	
63498	4	

D2894-1 Manufactured No 230 Each 12.0000 1 1

2.750 Support

8T 11-04-18

Location Loc Qty Loc Code

LG	12	
43713	4	
43881	8	

D3190-1 Manufactured No 230 Each 22.0000 2 2

Chafing Shield

8T 11-04-19

Location Loc Qty Loc Code

LG	22	
47456	2	
58569	20	

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Start Date: 1/24/2011

Required Date: 2/4/2011

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured No

230

Each

57.3390

2

2

67353

BT 11-04-18

RUBBER CUSHION

Location

Loc Qty

Loc Code

LG

24.33897368

53775

5.97897368

58161

3.56

59580

0.12

61465

4.68

63960

10

ST415

33

64171

32

64300

1

D407-667-205TRN

Manufactured No

110

Each

2.0000

1

1

SAD 11-03-30

Crosstube Turning Detail

Location

Loc Qty

Loc Code

LG

2

64683

1

64684

1

366265

①

MS20601-AD4W8

Purchased No

230

Each

206.0000

14

14

117106

BT 11-04-18 28

RIVET

Location

Loc Qty

Loc Code

LG

102

115855

2

116119

100

ST322

104

112203

104

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Start Date: 1/24/2011

Required Date: 2/4/2011

Start Qty: 1.00

Required Qty: 1.00

MS21920-25

Purchased

No

230

Each

123.0000

2

2

Clamp(per MIL-DTL-8783C)

-24

M107441

25

11-04-19

PTO

Location

Loc Qty

Loc Code

LG

99

113281

0

114759

5

114901

3

115278

1

115849

40

116264

50

ST451

24

113281

5

113282

18

113744

1

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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
11-04-20		use MS21920-24 damps instead of -25 no more stock -24 too long	<i>[Signature]</i>	11-04-20	1	<i>[Signature]</i> 11-04-21		

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

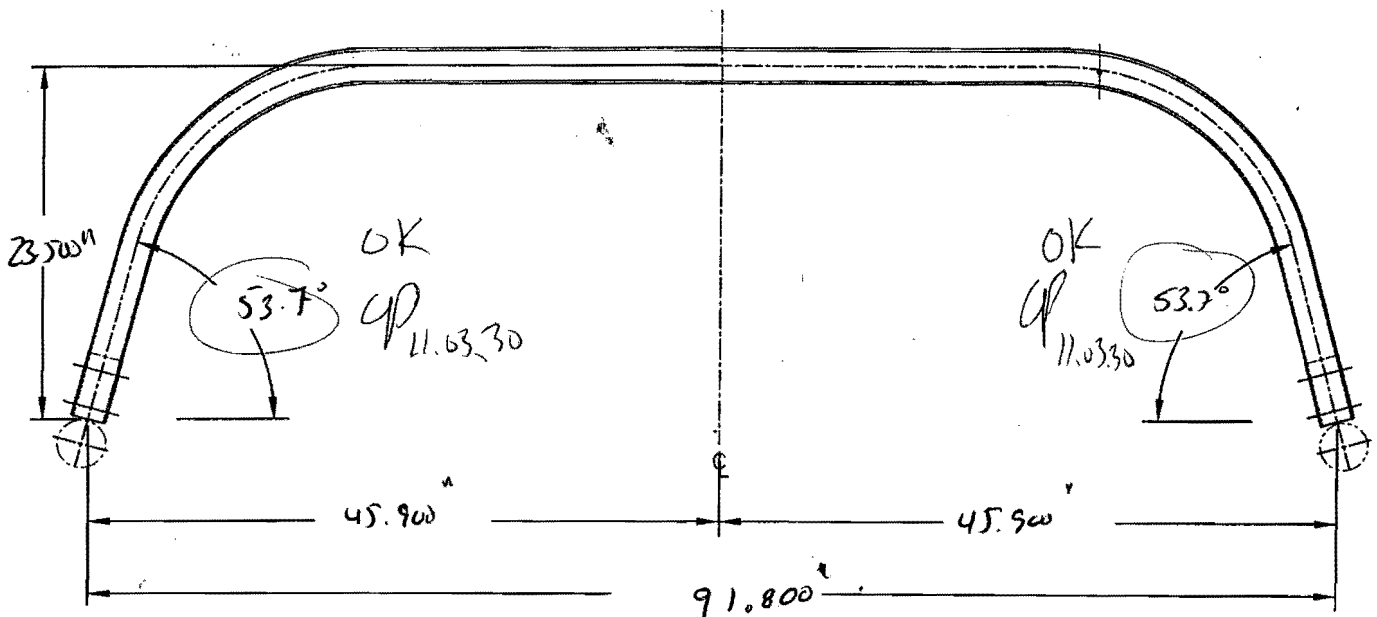
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NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order:	65699
Description: Crosstube High Aft (407)		Part Number:	D407-667-205
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1	

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	45.86	45.98
Angle	54	56
Total Span	91.72	91.96



Comments
Angle under tol. Acceptable CP 11.03.30

QC15 Inspection	8
Date	11/03/30

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)					
DATE	STEP	Description of NC Section A	Corrective Action Section B		Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng			

NOTE: Date & initial all entries

Item	QTY	PART NUMBER	DESCRIPTION
	-245		
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 27.7 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- 16) INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- 17) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
08/11/12

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES. ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	DRAWING NO.	REV. F
CHECKED	RF	D407-667-245	SHEET 1 OF 4
MFG. APPR.	RF	TITLE	SCALE
APPROVED	RF	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DE APPR.	RF	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR DISSEMINATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	
DATE	08.11.06		

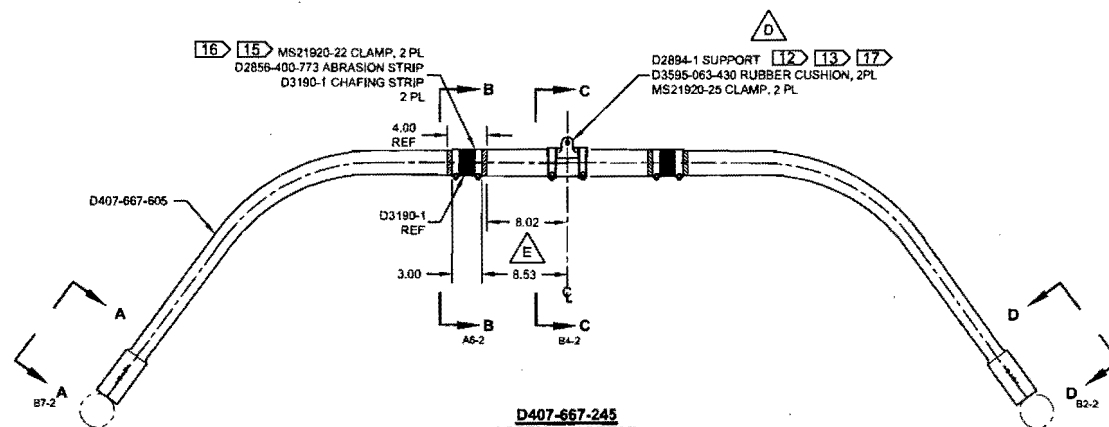
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

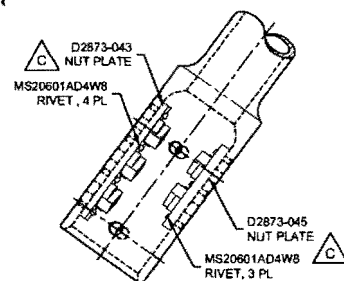
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

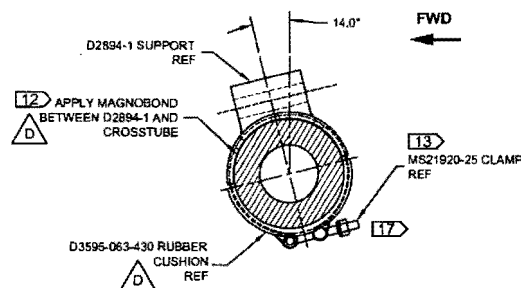
NOTE: Date & initial all entries



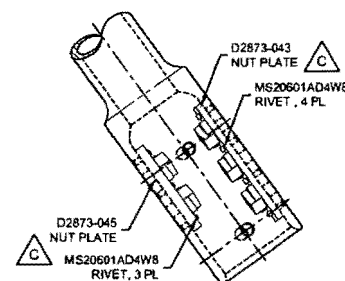
D407-667-245
ASSEMBLY DETAIL
(VIEW LOOKING FWD)



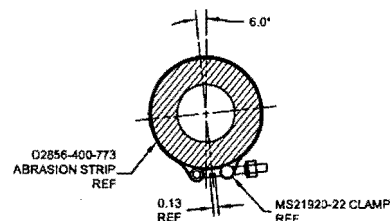
VIEW A-A CUFF DETAIL
SCALE 4X



SECTION C-C
SCALE 4X



VIEW D-D CUFF DETAIL
SCALE 4X



SECTION B-B
SCALE 4X, 2PL

RELEASED

DESIGN	9	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. F
MFG. APPR.	9	D407-667-245	SHEET 2 OF 4
APPROVED	9	TITLE	SCALE
DE APPR.	9	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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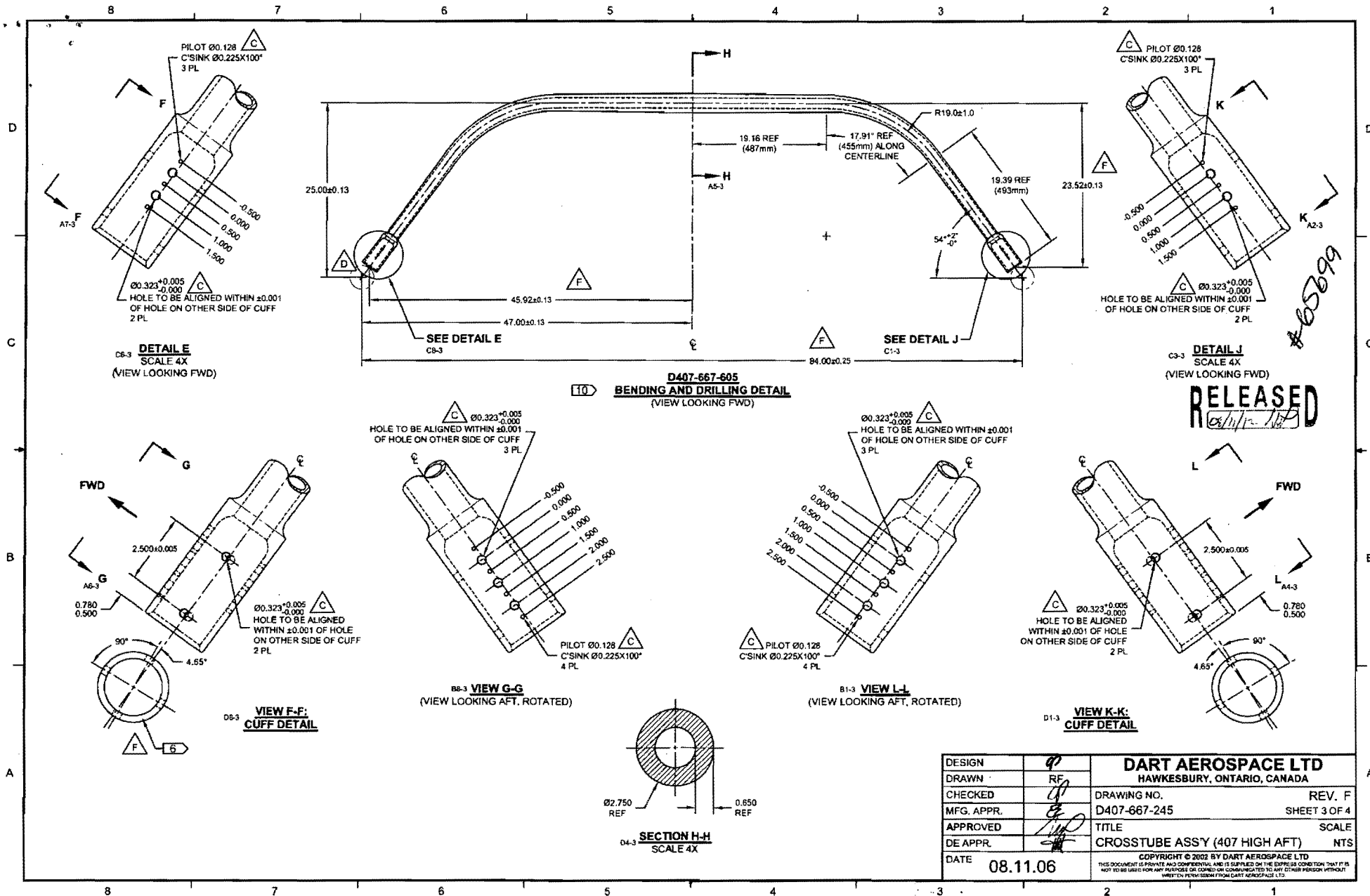
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN	90	DART AEROSPACE LTD
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	RF	DRAWING NO. REV. F
MFG. APPR.	RF	D407-667-245 SHEET 3 OF 4
APPROVED	RF	TITLE SCALE
DE APPR.	RF	CROSSTUBE ASS'Y (407 HIGH AFT) NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD

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W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

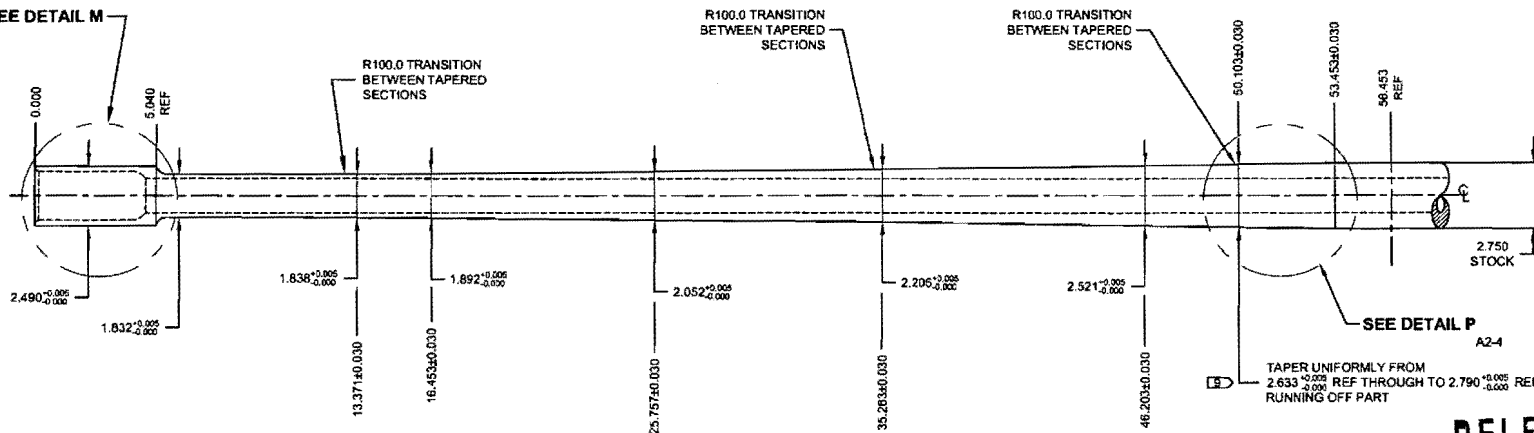
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

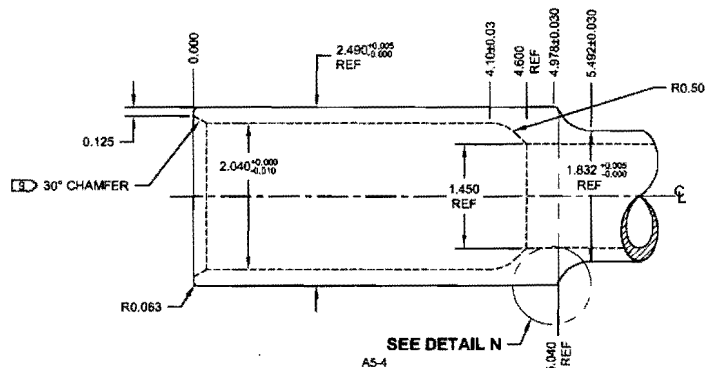
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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

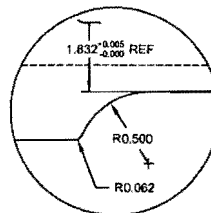
SEE DETAIL M
A7-4



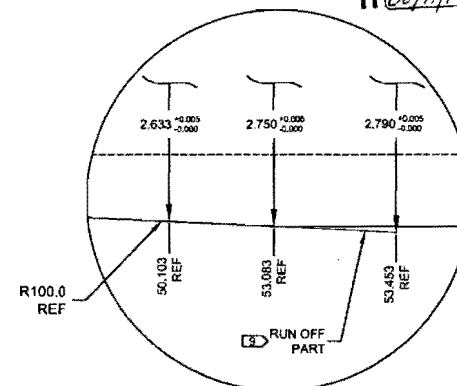
D407-667-245 MACHINING DETAIL



DETAIL M: CROSSTUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X



DETAIL P: TAPER RUN-OFF
NOT TO SCALE

RELEASED
08/11/2

DESIGN	P	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. F
MFG. APPR.	RF	D407-667-245	SHEET 4 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASSY (407 HIGH AFT)	NTS
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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

5.0 PARTS LIST

Item	Qty -011	Qty -013	Qty -015	Qty -101	Qty -201	Qty -103	Qty -203	Qty -105	Qty -205	Part Number	Description
	X									D206-667-011	SPACER BLOCK KIT
		X								D206-667-013	NUT PLATE KIT (-101/-103/-105/-203/-205)
			X							D206-667-015	NUT PLATE KIT (-201)
				X						D206-667-101	CROSSTUBE INSTALLATION, 206A/B HIGH FWD
					X					D206-667-201	CROSSTUBE INSTALLATION, 206A/B HIGH AFT
						X				D206-667-103	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 HIGH FWD
							X			D206-667-203	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 HIGH AFT
								X		D407-667-105	CROSSTUBE INSTALLATION, 407 HIGH FWD
									X	D407-667-205	CROSSTUBE INSTALLATION, 407 HIGH AFT
1				1						D206-667-141	CROSSTUBE ASSEMBLY, 206A/B HIGH FWD
2					1					D206-667-241	CROSSTUBE ASSEMBLY, 206A/B HIGH AFT
3						1				D206-667-143	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 HIGH FWD
4							1			D206-667-243	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 HIGH AFT
5								1		D407-667-145	CROSSTUBE ASSEMBLY, 407 HIGH FWD
6									1	D407-667-245	CROSSTUBE ASSEMBLY, 407 HIGH AFT
10				*2	*2	*2		*2		D2891-1	SUPPORT
11							*2			D2892-1	SUPPORT
12									*1	D2894-1	SUPPORT
13				*2	*2	*2		*2		D2856-400-694	ABRASION STRIP
14							*2		*2	D2856-400-773	ABRASION STRIP
15									*1	D2856-600-851	ABRASION STRIP
16				*4	*4	*4		*4		MS21920-20	CLAMP
17							*4		*4	MS21920-22	CLAMP
18									*2	MS21920-24	CLAMP
19				4	4	4		4		AN5-32A	BOLT
20							4		4	AN5-34A	BOLT
21				4	4	4	4	4	4	MS21042L5	NUT (OR MS21042-5)
22				8	8	8	8	8	8	AN960JD516	WASHER
23									*2	D3190-1	CHAFING SHIELD
30	8									AN4-6A	BOLT
31	8									AN4-7A	BOLT
32	16									AN960JD416	WASHER
33	2									D3193-041	SPACER BLOCK ASSEMBLY
40		2		*2		*2	*2	*2	*2	D2873-043	NUT PLATE
41		2		*2		*2	*2	*2	*2	D2873-045	NUT PLATE
42			2		2					D2872-043	NUT PLATE
43			2		2					D2872-045	NUT PLATE
44		10		10		10				AN5-7A	BOLT
45		10	10		10		10	10	10	AN5-10A	BOLT
46		4	4	4	10	4		4		AN5-30A	BOLT
47		4					4		4	AN5-32A	BOLT
48		18	18	10	12	10	10	10	10	AN960JD516	WASHER
49		4	4		6					MS21042L5	NUT (OR MS21042-5)

*REFERENCE ONLY. PARTS ARE INCLUDED IN D206-667-141/241/143/243, & D407-667-145/245 ASSEMBLIES ABOVE

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Revision: C

Date: 05.07.26

DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS IIN-D206-667 Rev. C AND
INSTRUCTIONS FOR CONTINUOUS AIRWORTHINESS ICA-D206-667 Rev. 2

REF. CANADIAN STC: SH01-5

REF. FAA STC: SR01304NY

REF. EASA STC: EASA.IM.R.S.01179

REFERENCE ONLY

For D407-667-205 High Aft Crosstube at CHG 007 or later, an inspection window has been added on the underside of the crosstube to facilitate inspection.

IMPORTANT NOTE: If a D407-667-205 Crosstube was stripped of paint, it should now be refinished as follows:

- 1) Apply chemical conversion film material (Alodine 1200 or 1201) per MIL-C-5541 and one coat of MIL-P-85582 or MIL-P-23377 primer.
- 2) Mask underside of crosstube as per hatched area shown in Figure 1.
- 3) Paint outside surfaces of crosstube by applying 2-3 coats of MIL-C-85285 polyurethane paint to match original finish.
- 4) Apply clear coat on inspection window (hatched area).

Additionally, for D407-667-205 High Aft Crosstube at CHG 007 or later, the D2856-400-773 Abrasion Strips have been removed and the D3190-1 Chafing Shields have been bonded onto the crosstube using Proseal 890. For D407-667-205 High Aft Crosstube at CHG 007 or later, amend Parts List of IIN-D206-667 Section 5.0 and ICA-D206-667 Section 32.8 as follows:

Remove:

Item	QTY -205	Part Number	Description
14	*2	D2856-400-773	ABRASION STRIP





If a D3190-1 Chafing Shield is being re-installed on the crosstube, it should now be re-installed as follows:

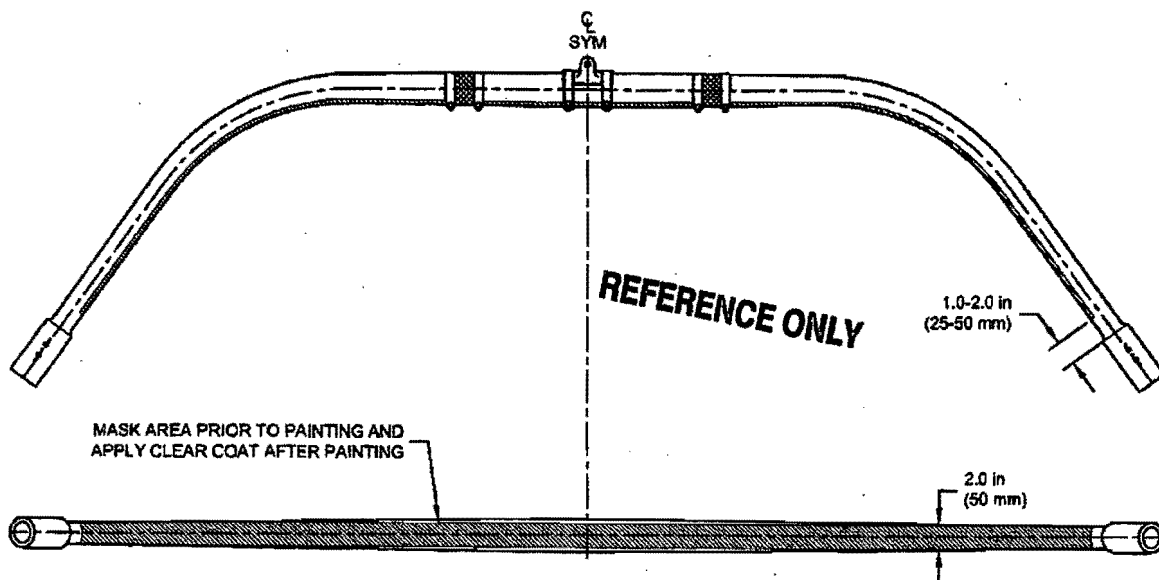
- 1) Follow section 32.1 of ICA-D206-667 for the removal of the crosstubes from the helicopter.
- 2) Remove the qty(2) MS21920-22 Clamps from the crosstube that fasten each D3190-1 Chafing Shield to the crosstube.
- 3) Remove the D2856-400-773 Abrasion Strips from the crosstube per section 32.5 of ICA-D206-667.
- 4) Inspect the crosstube surface where the chafing shields and abrasion strips were installed for corrosion and mechanical damage per items 5.3.1 and 5.3.2 of the 300 hour inspection. Repair damage within acceptable limits per item 5.3.3 of the 300 hour inspection. Touch up finish per item 5.3.9 of 300 hour inspection. If crosstube was stripped of paint, refer to above instructions for suitable refinishing of crosstube.
- 5) Apply a 0.02" to 0.04" (0.5-1.0 mm) thick layer of Proseal 890 on the concave surface of D3190-1 Chafing Shields and let cure per manufacturer's instructions.
- 6) Once the Proseal on the D3190-1 Chafing Shields is cured, apply a thin layer of Proseal 890 on the crosstube to cover the area where the Chafing Shields will be installed.
- 7) Locate the D3190-1 Chafing Shield as shown in Figure 2. Ensure that the overlapping edge of the chafing shield is located at approximately 60° from bottom vertical to prevent deterioration of the rubber bumpers. Be sure to eliminate any air gaps.
- 8) Position and tighten the clamps to a torque of 80-100 in-lb (9.0-11.3 N-m).
- 9) Allow the assembly to cure for 12 hours.
- 10) Re-install the D407-667-205 crosstube per section 32.2 of ICA-D206-667.

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

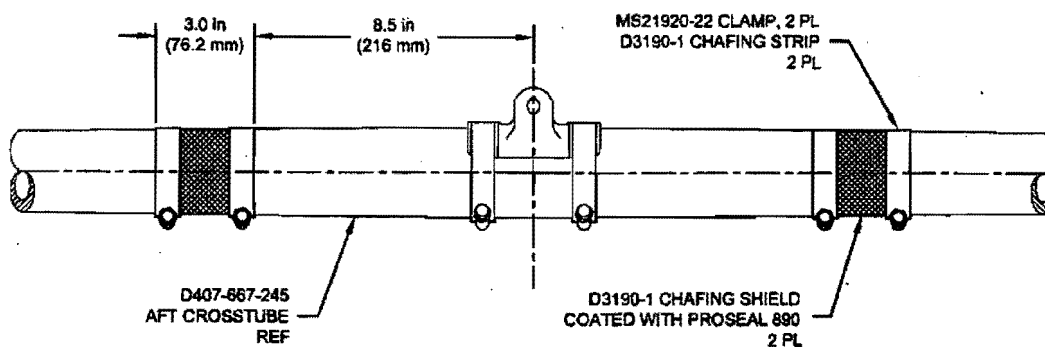
APPROVED
BY: 
D. SHEPHERD (DE # 02)

DATE: 11.04.07
CERT. NO.: SH01-5
ISSUE NO.: 3

A	NEW ISSUE	MB	11.04.07
REV.	DESCRIPTION	BY	DATE
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		DSI 9550	SHEET 1 OF 2
APPROVED		TITLE	SCALE
DE APPR.		D407-667-205 FINISHING CHANGE	NTS
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**FIGURE 1 - INSPECTION WINDOW ON
D407-667-205 CROSSTUBES**



**FIGURE 2 - CHAFING SHIELD
INSTALLATION ON D407-667-205**

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED

BY: *[Signature]*
D. SHEPHERD (DE # 02)

DATE: 11.04.07
CERT. NO.: SH01-5
ISSUE NO.: 3

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		DSI 9550	SHEET 2 OF 2
APPROVED		TITLE	SCALE
DE APPR.		D407-667-205 FINISHING CHANGE	NTS
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RAPPORT D'INSPECTION PAR RESSUAGE

P- 12618

PAGE 1 DE 1

CLIENT **DART AEROSPACE**
ATTENTION **LINDA CHANTE**
ADRESSE **1270 ABERDEEN ST
HAWKESBURY, ONTARIO**
PROJET **FPI ON 10 CROSSTUBE**
ITEM(S) EXAMINÉ

DATE **2011-04-05** HEURE **7:30** AM ☐ PM ☐
N° TRAVAIL **188-11-02070**
ACUREN
N° CLIENT PO/VO **13801**
SITE DE TRAVAIL **HAWKESBURY**
ACCEPTATION STD. **ASTM E1417 / QSL-038** DATE/REV. **2005**

DESCRIPTION DES TRAVAUX N° PROCÉDURE **LT-002** DATE/REV. **2008** N° TECHNIQUE **LT-002-Tall-2** DATE/REV.
N° ITEMS MATÉRIEL **ALUM. 2024** ÉPAISSEUR **VARIÉS**
DESCRIPTION **wet Fluorescent Liquid Penetrant inspection
CARRIED OUT ON 100% EXTERNAL SURFACE**

DÉTAILS DES INSPECTIONS

MÉTHODE : ☒ FLUORESCENT ☐ VISIBLE ☒ LAVABLE À L'EAU ☐ MÉTHODE DISSOLVANT ☐ PRÉ-ÉMULSIONNANT
MARQUE : **MAGNAFLUX** LUM. NOIRE S/N **6404073** PUISS. > 1 000 µ W/cm² ☐ AMBIANT < 2 fc
PÉNÉTRANT : **2LG7** TEMPS PÉNÉTRATION MIN. **45** MIN. ÉQUIP. LUMIÈRE ☒ LAMP. POCHÉ ☐ LAMP. CULASSE ☐ PUISS. > 100 fc @ SURFACE
DISSOLVANT PÉNÉTRANT **H2O** TEMPS SÈCHAGE MIN. **>10** MIN. AUTRES
RÉVÉLATEUR **SDS2** TEMPS RÉVÉLATION MIN. **10** MIN. MÈTRE LUM. N/S DATE CAL DUE **07/19/2011**
TYPE RÉVÉLATEUR ☒ NON AQUEUX ☐ AQUEUX ☐ SEC **1898866**

SURFACE INSPECTÉE

CONDITION SURFACE ☐ MEULÉE ☐ SOUDÉE ☐ MACHINÉE ☐ MRENAILLÉE ☒ MÉTAL PROPRE
TEMPÉRATURE SURFACE ☐ < - 4°C/20°F ☐ - 4°C/20°F A 10° C/50°F ☒ 10°C/50°F A 52°C/125°F ☐ > 52°C/125°F

RÉSULTATS (☐ MÉTRIQUE ☐ IMPÉRIALE)

ITEM	COMMENTAIRES	ACCEPTÉ	REJETÉ
1	CROSSTUBE WO 66346	✓	
1	CROSSTUBE WO 67211	✓	
1	CROSSTUBE WO 67210	✓	
1	CROSSTUBE WO 65700	✓	
1	CROSSTUBE WO 65699	✓	
1	CROSSTUBE WO 67868	✓	
1	CROSSTUBE WO 67869	✓	
1	CROSSTUBE WO 67439	✓	
1	CROSSTUBE WO 67440	✓	
1	CROSSTUBE WO 66345	✓	

Étendue des Services

L'entente selon laquelle le Groupe Acuren Inc. exécute les services ne concerne que les énoncés par écrit. En aucune circonstance ces services ne s'étendent au-delà de l'exécution des services demandés. Il est entendu que toutes les descriptions, les observations et les expressions d'opinions faites par Acuren reflètent les opinions ou les observations de l'entreprise fondées sur l'information et les hypothèses fournies par le propriétaire/opérateur, et elles ne constituent pas des déclarations ou des garanties ou ne peuvent être interprétées comme constituant. Le Groupe Acuren Inc. n'assume aucune des responsabilités du propriétaire/opérateur, et le propriétaire/opérateur conserve la responsabilité entière des décisions prises en matière d'ingénierie, de fabrication, de réparation et d'usage à partir de l'information ou des données fournies par Acuren en rapport avec les services décrits dans les présentes ne peuvent excéder le coût des services rendus.

Norme de Diligence

Dans l'exécution des services, le Groupe Acuren Inc. applique le degré de diligence, le soin et la compétence normalement exercés dans des circonstances semblables par d'autres fournisseurs de ce type de services opérant dans la même localité ou dans une localité similaire. Aucune autre garantie, implicite ou explicite, n'est faite ou voulue par le Groupe Acuren Inc.

SIGNATURES

REPRÉSENTANT **Matthew Murdoch** FTJ#:
TECHNICIEN (SIGNATURE): **David Rechin** MOULÉ SIGNATURE
NOM (MOULÉ): **DAVID RECHIN** 1^{er} TECHNICIEN 2nd TECHNICIEN
ONGC NIVEAU **2** SNT NIVEAU _____ ONGC NIVEAU _____ SNT NIVEAU _____
ONGC N° REGISTRATION _____ ONGC N° REGISTRATION _____
RAPPORT RÉVISÉ PAR: _____ NOM _____ INITIALES _____

